DIGI-88

8x8 HDMI 1.4a Matrix

User Manual

Safety and Notice

The DIGI-88 8x8 HDMI 1.4a Matrix has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the DIGI-88 should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.

- Do not attempt to service this unit yourself, except where explained in this manual.

- Provide proper ventilation and air circulation and do not use near water.

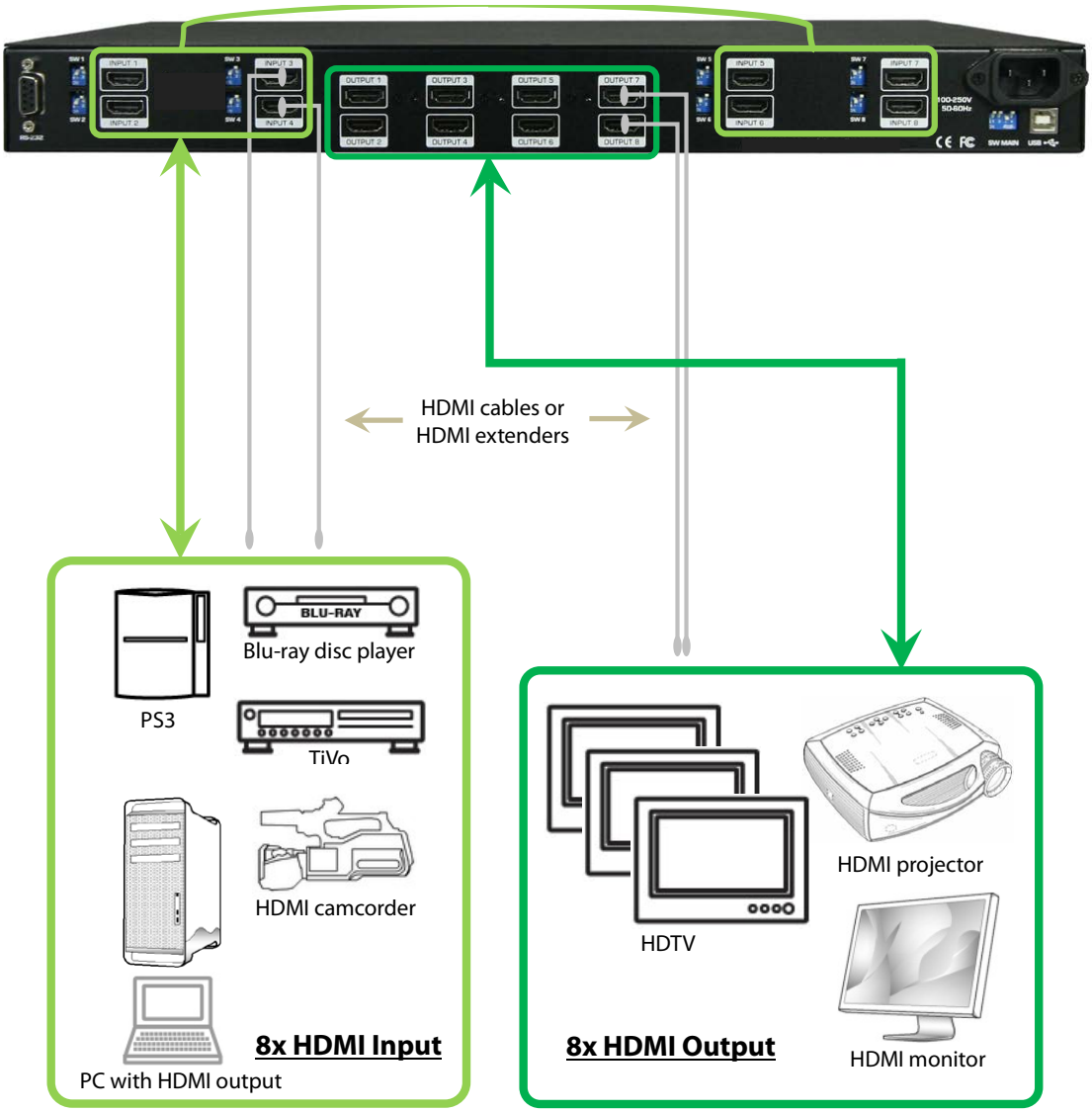
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.

- Use only the power adapter and power cords and connection cables designed for this unit.

- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

Introduction

The DIGI-88 8x8 HDMI 1.4a 3D Matrix provides the most flexible and cost effective solution in the market to route high definition video sources plus multi-channel (up to 7.1 channel) digital audio from any of the eight HDMI sources to the any eight displays at the same time. This solution is well suited for use in home theater, conference room presentation systems, or other similar setting or application.



Features

- State-of-the-art Silicon Image (Founder of HDMI) chipset embedded for upmost compatibility and reliability

- HDMI 1.4a 3D compliant

- HDCP compliant

- Allows any source to be displayed on multiple displays at the same time

- Allows any HDMI display to view any HDMI source at any time

- Supports 7.1 channel digital audio

- Supports default HDMI EDID and learns the EDID of displays if necessary

- The matrix master can switch every output channels to any HDMI inputs by push button, IR remote control, RS-232 control, or USB control

- Easy installation with rack-mounting and wall-mounting designs for master and receiver respectively

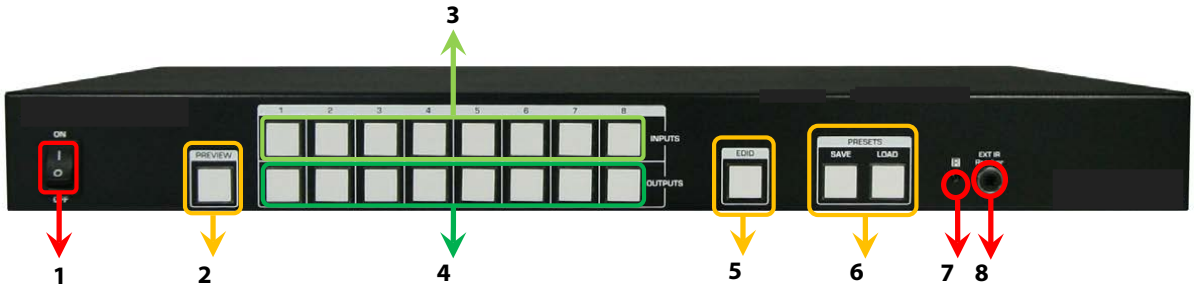
- Fast response time – 2~5 seconds for channel switch

Specifications & Package Contents

Technical		
Role of usage		True 8x8 matrix
HDMI compliance		HDMI 1.4a
HDCP compliance		Yes
Video bandwidth		Single-link 225MHz [6.75Gbps]
Video support		480i / 480p / 720p / 1080i / 1080p60 8-12 bit color
Audio support		Surround sound (up to 7.1ch) or stereo digital audio
ESD protection		[1] Human body model: ±19kV [air-gap discharge] & ±12kV [contact discharge] [2] Core chipset: ±8kV
PCB stack-up		4-layer board [impedance control — differential 100Ω; single 50Ω]
Input		8x HDMI + 1x RS-232 + 1x USB + 1x 3.5mm
Output		8x HDMI
HDMI input selection		Push button / IR remote / RS-232 / USB
IR remote control		Electro-optical characteristics: $\tau = 25°$; carrier frequency: 36-40kHz
HDMI connector		Type A [19-pin female]
RS-232 connector		DE-9 [9-pin D-sub female]
USB connector*		Standard type-B [square shape]
3.5mm connector		IR socket for IR receiver
DIP Switch		[SW1-SW8]: 2-pin for EDID & audio/video settings [SW Main]: 4-pin for normal operation or firmware update
Mechanical		
Housing		Metal enclosure
Dimensions [L x W x H]	Model	290 x 440 x 44mm [11.4" x 1'5" x 1.7"]
	Package	400 x 530 x 130mm [1'4" x 1'9" x 5"]
Weight	Model	3250g [7.2 lbs]
	Package	5700g [12.6 lbs]
Fixedness		1RU rack-mount with ears
Power supply		AC Power 100-240V
Power consumption		60 Watts [max]
Operation temperature		0~40°C [32~104°F]
Storage temperature		-20~60°C [-4~140°F]
Relative humidity		20~90% RH [no condensation]

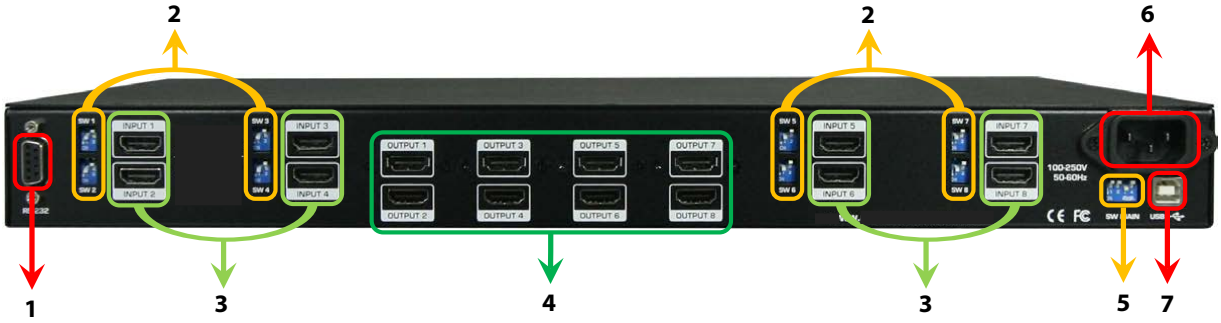
Panel Descriptions

Front Panel



1. **Power:** power on/off switch
2. **PREVIEW Button:** press **PREVIEW** to watch input/output mapping. This function is active when the button is bright
3. **INPUT Buttons:** press respective button to select input port 1 to 8
4. **OUTPUT Buttons:** press respective button to select output 1 to 8
5. **EDID Button:** press **EDID** button to enter EDID operation (for more detail please see EDID learning section in page 17). This function is active when the button is bright
6. **PRESETS Buttons:** Save the current input/output mapping to presets or load one of the preset input/output mappings to current configuration by pressing **SAVE** or **LOAD** button respectively
7. **IR:** infrared sensor to receive any IR commands from the IR remote control
8. **EXT IR Receiver:** plug in an IR receiver here to receive any IR commands from the IR remote control

Rear Panel



1. **RS-232**: for channel control via RS-232 serial control port
2. **SW1** – **SW8**: two-pin DIP switch for manual EDID and audio/video settings (for more detail please see DIP Switch section in page 7)
3. **INPUT 1** – **INPUT 8**: eight HDMI input ports that connect to HDMI source devices
4. **OUPUT 1** – **OUTPUT 8**: eight HDMI output ports that connect to HDMI displays
5. **SW Main**: four-pin DIP switch for normal operation or firmware update (for more detail please see DIP Switch section in page 8)
6. **AC Power:** plug in the UL AC C13 power cord for 100-250V 50-60Hz AC power
7. **USB**: for channel control via USB control port

SW1-SW8 for EDID & audio/video settings

DIP Switch Position		Video	Audio	Description
Pin 1	Pin 2			
OFF [↑]	OFF [↑]	Up to 1080p	Stereo[1]	**Default Mode[2]** – Up to 1080p & stereo audio output for most HDTV
OFF [↑]	ON [↓]	Up to 720p/1080i	Stereo	**Safe Mode[3] –** Enforce the system output at 720p/1080i video and stereo audio for basic compatibility among HDTVs
ON [↓]	OFF [↑]	Bypass[4]	Bypass[4]	**EDID Learning Mode[5]** – for learning EDID from the display while playing any received HDMI audio format
ON [↓]	ON [↓]	Bypass	Stereo	**EDID Learning & Stereo Mode[5]** – for learning EDID from the display while enforcing stereo output if any HDTV cannot play surround sound normally

Note

[1] *If the HDTV shows video but without audio, please try to set audio mode to stereo.*

[2] *Factory default setting of* [**SW1**]-[**SW8**] *is pin 1*-OFF[↑] & *pin 2*- OFF[↑] *for 1080p with stereo.*

[3] *If you encounter any unsolved audio/video output problem during system installation, please turn any* [**SW1**]-[**SW8**] *to pin#1*-OFF[↑] & p*in#2*-ON[↓] *for safe mode to enforce the most compatible 720p stereo output for system check. However, the safe mode cannot be initiated if your HDMI source is set to enforce 1080p output. In this case, please reconfigure your HDMI source to all resolution output for troubleshooting.*

[4] *Bypass means the matrix will maintain playing the original format of HDMI signals in video and perhaps audio. By setting at this mode, the users may encounter compatibility issue among different kinds of HDMI sources and displays. If you cannot get the audio and/or video output normally at the system installation, please change the DIP switch setting to default mode or even safe mode to verify the functionality of the device.*

[5] *To learn the EDID of the HDMI display for respective HDMI source devices, please see the* [**EDID Learning**] *section in page12 for more detail information.*

SW Main for firmware update (for technical support only)

DIP Switch Position		Pin 1	Pin 2	Pin 3	Pin 4
Normal Operation Mode [via RS-232 port][6]		OFF[↑]	OFF[↑]	OFF[↑]	OFF[↑]
Normal Operation Mode [via USB port][7]		OFF[↑]	OFF[↑]	OFF[↑]	ON[↓]
Firmware Update Mode[8]	Block A [main]	ON[↓]	OFF[↑]	OFF[↑]	OFF[↑]
	Block B [remote]	ON[↓]	OFF[↑]	ON[↓]	OFF[↑]
	Block C [HDMI]	ON[↓]	ON[↓]	OFF[↑]	OFF[↑]

Note

6
Factory default for SW Main is pin 1-OFF[↑], pin 2-OFF[↑], pin 3-OFF[↑], & pin 4-OFF[↑].
PLEASE MAINTAIN THIS SETTING AT ANYTIME FOR REGULAR USE VIA RS-232 CONTROL!

7
Factory default for SW Main is pin1-OFF[↑], pin2- OFF[↑], pin 3-OFF[↑], & pin 4-ON[↓].
PLEASE MAINTAIN THIS SETTING AT ANYTIME FOR REGULAR USE VIA USB CONTROL!

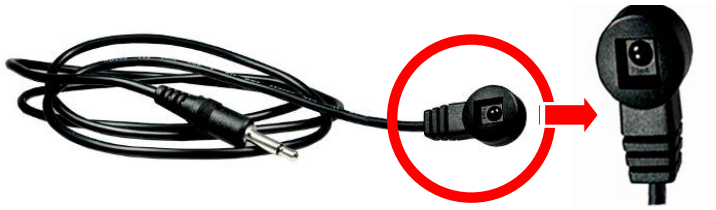
8
Sequence for firmware update

WARNING! [Firmware update only can be done via RS-232 port and connection to PC set at COM1)

1. Power off the DIGI-88. Execute the firmware update program on your PC via COM1 port connection to the RS-232 port of the DIGI-88 using a straight through (pin-pin) cable.
2. Set the pin 1 of [SW Main] at ON[↓] for Firmware Update Mode.
3. Set pin 2 and pin 3 at respective positions to assign which Block to be updated.
4. Power on the DIGI-88. The firmware update program should begin this update sequence automatically. If not, please check the RS-232 connection status between PC and DIGI-88.
5. After the OK message shows up to indicate the firmware update sequence for designated Block is complete, please turn off the DIGI-88.
6. Repeat step 3 ~ step6 if you want to update the firmware of the remaining Blocks.
7. Set the [SW Main] switch position to Normal Operation Mode.
8. Power on the DIGI-88.

External IR

IR Receiver



Supported IR Data Format

Data Format	Suitable	Not Recommended
NEC	✓	
RC5	✓	
TOSHIBA MICOM CODE	✓	
GRUNDIG CODE	✓	
SONY 12 BIT CODE	✓	
SONY 15 BIT CODE	✓	
SONY 20 BIT CODE	✓	
RCA CODE		✓
RCM CODE		✓
MATSUSHITA CODE		✓
MITSUBISHI CODE	✓	
ZENITH CODE	✓	
JVC CODE	✓	
M50560-001P	✓	
MN6125H	✓	
MN6125L	✓	
MN6014_C5D7	✓	
MN6014-C6D6	✓	
MC14457P	✓	
LC7464(AHEA)	✓	
GEMINI_CM	✓	

Channel Control

Source Side

Method A: Push input/output buttons

1. Press the **INPUT** button on the front panel to select input source port, which will be bright once selected.
2. Press the **OUTPUT** buttons on the front panel to select output display ports, which will be bright once selected, to display HDMI signal from selected input port.

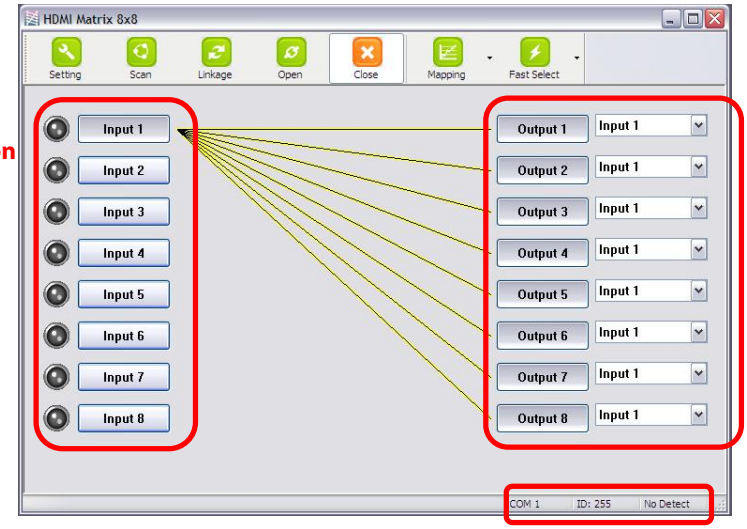
Method B: IR Remote control

POWER	Power on/off
Fn	Function key
INPUT 1	HDMI input port 1
INPUT 2	HDMI input port 2
INPUT 3	HDMI input port 3
INPUT 4	HDMI input port 4
INPUT 5	HDMI input port 5
INPUT 6	HDMI input port 6
INPUT 7	HDMI input port 7
INPUT 8	HDMI input port 8
OUTPUT 1	HDMI output port 1
OUTPUT 2	HDMI output port 2
OUTPUT 3	HDMI output port 3
OUTPUT 4	HDMI output port 4
OUTPUT 5	HDMI output port 5
OUTPUT 6	HDMI output port 6
OUTPUT 7	HDMI output port 7
OUTPUT 8	HDMI output port 8

1. Select one input port from **INPUT 1** to **INPUT 8** in the MATRIX SIDE section.
2. Select the output ports from **OUTPUT 1** to **OUTPUT 8** in the MATRIX SIDE section to show this selected input source channel

Function Key	FUNCTION
FN + SOURCE SEL. 1	Escape System LOCK
FN + SOURCE SEL. 2	Enter System LOCK (most buttons, IR control, and RS-232 control become inactive, except Escape System LOCK command)

Method C: Software control through RS-232 or USB port



HDMI input source selection mapping area

HDMI output port selection mapping area

Software Control Menu

Status Indicator

1. **Scan button**

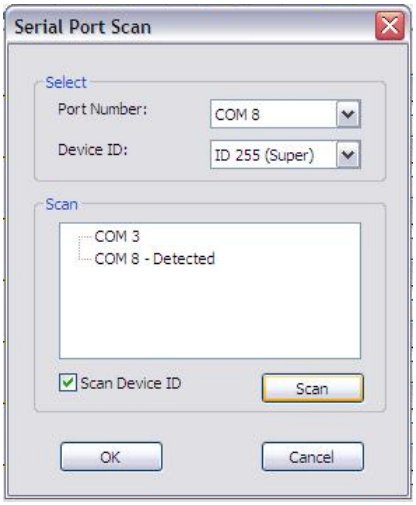
   Serial Port Scan

   Press **Scan** button, the machine will scan the all com port and show them.

   Select the RS232 serial port connected to the machine. And set device ID 255 is for all device.

   Only the same device id or 255 can get the command you sent.

   Press **OK**. Get the new status from the machine you select.



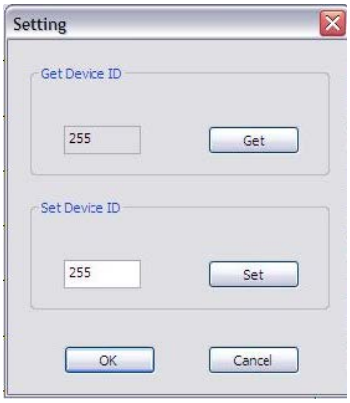
2. **Setting button**

   Press **Get** button to read back device ID.
   Press **Set** button to write device ID.

3. **Linkage button**

   Press **Linkage** button to read back all status.

4. **Open/Close button**

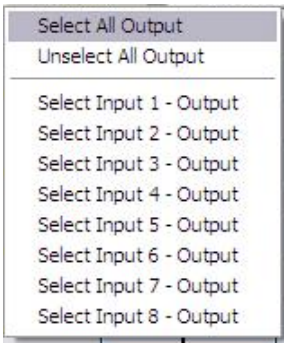


Press this button to close or open COM port.

5. Mapping button

Select All Output

Select "set all output," then select the source on main menu. You can quickly set all output to the same source.


Select All Output
Unselect All Output
Select Input 1 - Output
Select Input 2 - Output
Select Input 3 - Output
Select Input 4 - Output
Select Input 5 - Output
Select Input 6 - Output
Select Input 7 - Output
Select Input 8 - Output

Unselect All Output

Release output selection.

Select Input1~8-Output

Select Input Source. Then select the output port icon.

Example

Select input source 1. Then select output port 1 and port 2. The video and audio will be sent to port 1 and port 2.

6. Fast Select button:

Press **Fast select** button for quick setting

Input one ➡ Output Port one

Input two ➡Output Port two

…..

Press Fast select pull down menu

Select Input Num-Output Num

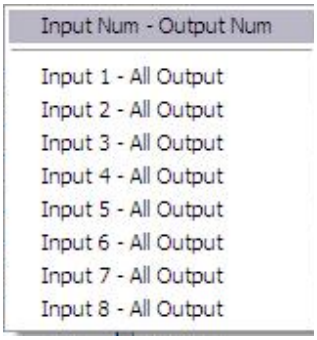
Input source #1 ➡ Output port #1

Input source #2 ➡ Output port #2

……

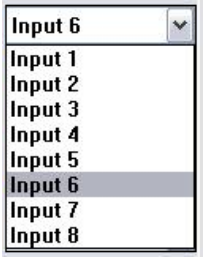
Select Input - All Output

Send the same source to all output


Input Num - Output Num
Input 1 - All Output
Input 2 - All Output
Input 3 - All Output
Input 4 - All Output
Input 5 - All Output
Input 6 - All Output
Input 7 - All Output
Input 8 - All Output

7. Output Port:

Pull down menu and select which source to be sent to this output port.



One by one setting

On main menu screen

First select input source. Then select the output ports which you want to send the video and audio from this source. When you select the input source, the source will change to gray. When you select the output port one by one, the selected output port will change to gray.

The linking line will change to yellow.

Group setting

First select output ports one by one. Then select the input source. The selected output ports change the setting at the same time.

By using Terminal

Baud rate: 9600
Data length: 8bit
Parity check: No
Stop bit: 1

RS-232 DB9 Pin Definition

Pin 2 Tx →, Pin 3 Rx ←, Pin 5 Ground

Command Set:

! is the start character to active a command
? is the start character to query status
~ is the start character of the response
/x0D (<cr> aka carriage return) is the end character

COMMAND	ACTION	COMMAND	ACTION	COMMAND	ACTION
!R	Change Route	**?R**	Query route	**!P**	Preset recall
VR	Firmware Version				

Examples:

To route input 1 to output 3, 4, 5, the command would look like: **!R1to3,4,5<cr>**
The response is **~R1to3,4,5<cr>**

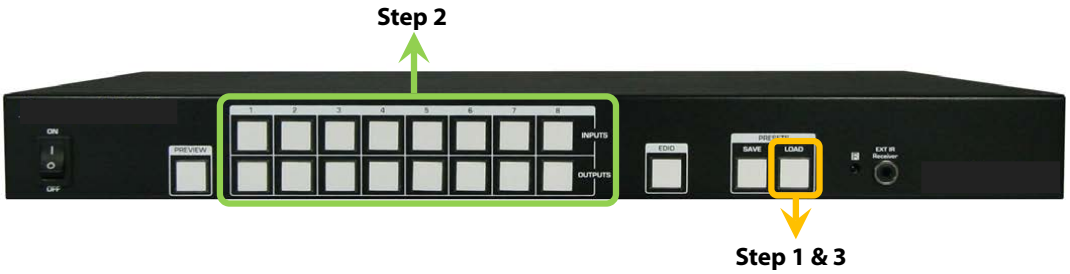
Use a zero to remove a routed signal to an output. For example, to remove the route from output 3, 4, 5, the command would look like: **!R0to3,4,5<cr>**
The response is **~R0to3,4,5<cr>**

A query could be **?R1<cr>**
Example response would is **~R1to3,4,5<cr>**

To trigger a preset, the command would look like: **!P01<cr>**
The response is **~P01<cr>**

Method 4: Preset mappings

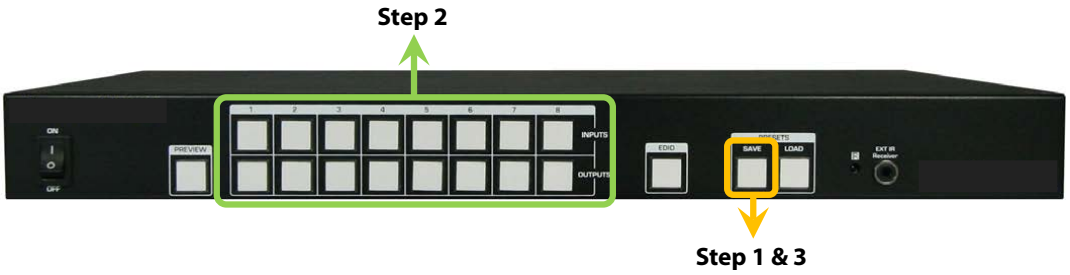
a. Load one of the presets



1. Press the **LOAD** button in the PRESETS menu on the front panel and the LED will turn on.
2. Select the preset profile number to load the corresponding mapping.
3. Press the **LOAD** button to execute the setting. After loading procedure, the LED will turn off.

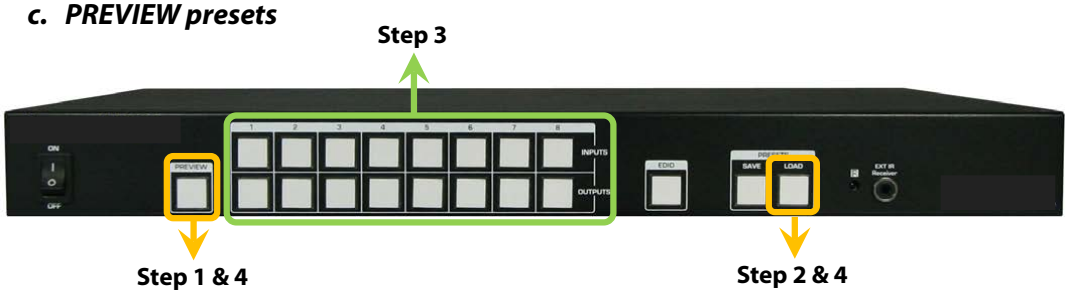
Input Port	Preset Profile Number	Output Port	Preset Profile Number
1	1	1	9
2	2	2	10
3	3	3	11
4	4	4	12
5	5	5	13
6	6	6	14
7	7	7	15
8	8	8	16

b. Save the current mapping configuration into presets



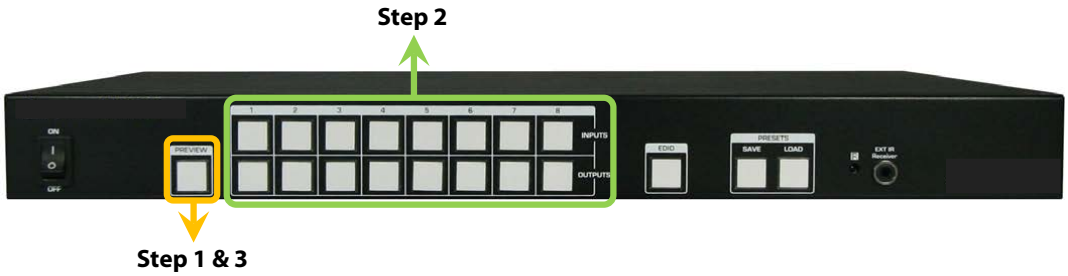
1. Press the **SAVE** button in the PRESETS menu on the front panel and the LED will turn on.
2. Select the preset profile number and save the current mapping profile to the memory.
3. Press the **SAVE** button to execute the setting. After loading procedure, the LED will turn off.

c. PREVIEW presets



1. Press the **PREVIEW** button on the front panel.
2. Press the **LOAD** button.
3. Select the preset profile number to load the corresponding mapping and press the respective button.
4. Press the **LOAD** button or **PREVIEW** button to escape PREVIEW presets state

d. PREVIEW INPUT/OUTPUT mapping status



1. Press the **PREVIEW** button on the front panel.
2. Check mapping by push **INPUTS** or **OUTPUTS** buttons.
3. Press the **PREVIEW** button to escape PREVIEW status.

EDID Learning

The EDID learning function is only necessary whenever you encounter any display connected to the HDMI output port that cannot play audio and video properly. Because the HDMI source devices and displays may have various level of capability in playing audio and video, the general principle is that the source device will output the lowest standards in audio format and video resolutions to be commonly acceptable among all HDMI displays. In this case, a 720p stereo HDMI signal output would be probably the safest choice. Nevertheless, the user can force the matrix to learn the EDID of the lowest capable HDMI display among others to make sure all displays are capable to play the HDMI signals normally by performing the procedures stated below.

SW1-SW8's Pin 1 must be set to "ON" and left there for EDID Learning Mode. Turning to "OFF" will return to factory defaults.

DIP Switch Position Pin 1	Description
ON [🡻]	**EDID Learning** – for learning EDID from the display

Method 1: Use the front panel on the master unit

Button	Function
OUTPUT 1-8	EDID will be read from display from the respective output port
INPUT 1-8	The EDID will be sent to the HDMI source connected to respective HDMI input port

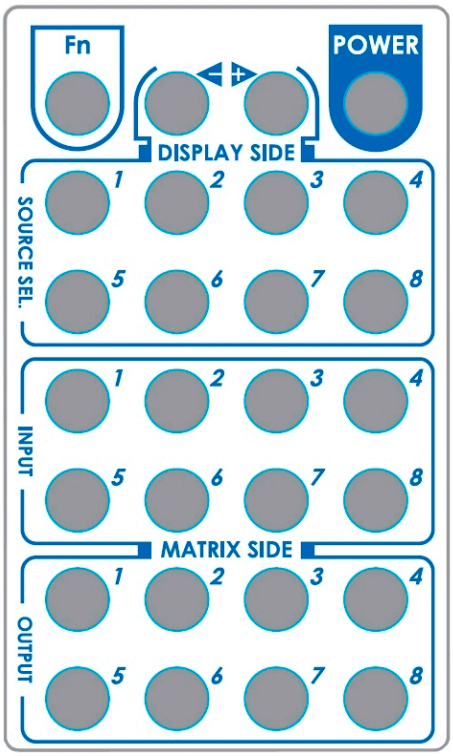
1. Push **EDID** button to enter EDID learning mode
2. Select one or multiple **INPUTS 1-8** buttons that you want those input ports to learn the EDID of the display from certain **OUTPUT** port. The input port is selected when the LED is on. Push the **INPUT** button again if you want to cancel this input port to learn EDID.
3. Select the HDMI display that you want the matrix to learn its EDID by push the **OUTPUT** button connected to this display.
4. Press the **EDID** button to initiate the EDID learning sequence. If the sequence is done successfully, the front panel will get back to normal operation mode. If the sequence is failed, the LED of the chosen input ports will flash then please try again.

Method 2: Manually connect HDMI displays to HDMI input ports

1. Power up the matrix. Connect the HDMI display that its EDID needs to be learned to any of the HDMI **INPUT1-INPUT8** port where your source device has trouble to show the picture normally.
2. To learn the display's EDID for source device connected to respective HDMI **INPUT1**-**INPUT8** port, pull both pins of respective DIP switch **SW1-SW8** up-and-down to stay at ON[🡻]-ON[🡻] and wait for about 5 seconds to complete the EDID learning process. You DON'T NEED to pull up the DIP switch again unless you want to learn another display's EDID by pulling both DIP switch pin-1 & pin-2 of **SW1-SW8** up-and-down one more time.
3. Repeat step1 & step2 if you want to learn the EDID of this HDMI display on any other HDMI input ports that have same trouble playing the audio/video properly.

IR Discrete Code

Default Custom Code — IR2 Code: 00 FF



Function **0x17**	**0x0A**	**0x0C**	POWER **0x02**
SOURCE SEL. 1 **0x54**	SOURCE SEL. 2 **0x55**	SOURCE SEL 3 **0x56**	SOURCE SEL. 4 **0x01**
SOURCE SEL. 5 **0x57**	SOURCE SEL. 6 **0x58**	SOURCE SEL. 7 **0x59**	SOURCE SEL. 8 **0x06**
INPUT 1 **0x18**	INPUT 2 **0x5B**	INPUT 3 **0x19**	INPUT 4 **0x07**
INPUT 5 **0x1B**	INPUT 6 **0x5A**	INPUT 7 **0x1A**	INPUT 8 **0x04**
OUTPUT 1 **0x0E**	OUTPUT 2 **0x0D**	OUTPUT 3 **0x12**	OUTPUT 4 **0x05**
OUTPUT 5 **0x1C**	OUTPUT 6 **0x1D**	OUTPUT 7 **0x1F**	OUTPUT 8 **0x1E**

Custom Code — IR3 Code: 0x12 0x21

Custom Code: 0x12 0x21								
	Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
Source 1	**0xA1**	**0xB1**	**0xC1**	**0xD1**	**0xE1**	**0xF1**	**0x11**	**0x21**
Source 2	**0xA2**	**0xB2**	**0xC2**	**0xD2**	**0xE2**	**0xF2**	**0x12**	**0x22**
Source 3	**0xA3**	**0xB3**	**0xC3**	**0xD3**	**0xE3**	**0xF3**	**0x13**	**0x23**
Source 4	**0xA4**	**0xB4**	**0xC4**	**0xD4**	**0xE4**	**0xF4**	**0x14**	**0x24**
Source 5	**0xA5**	**0xB5**	**0xC5**	**0xD5**	**0xE5**	**0xF5**	**0x15**	**0x25**
Source 6	**0xA6**	**0xB6**	**0xC6**	**0xD6**	**0xE6**	**0xF6**	**0x16**	**0x26**
Source 7	**0xA7**	**0xB7**	**0xC7**	**0xD7**	**0xE7**	**0xF7**	**0x17**	**0x27**
Source 8	**0xA8**	**0xB8**	**0xC8**	**0xD8**	**0xE8**	**0xF8**	**0x18**	**0x28**

Custom Code — IR4 Code: 0x13 0x31

Custom Code: 0x13 0x31								
	Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
Source 1	**0xAE**	**0xBE**	**0xCE**	**0xDE**	**0xEE**	**0xFE**	**0x1E**	**0x2E**
Source 2	**0xAD**	**0xBD**	**0xCD**	**0xDD**	**0xED**	**0xFD**	**0x1D**	**0x2D**
Source 3	**0xAC**	**0xBC**	**0xCC**	**0xDC**	**0xEC**	**0xFC**	**0x1C**	**0x2C**
Source 4	**0xAB**	**0xBB**	**0xCB**	**0xDB**	**0xEB**	**0xFB**	**0x1B**	**0x2B**
Source 5	**0xAA**	**0xBA**	**0xCA**	**0xDA**	**0xEA**	**0xFA**	**0x1A**	**0x2A**
Source 6	**0xA9**	**0xB9**	**0xC9**	**0xD9**	**0xE9**	**0xF9**	**0x19**	**0x29**
Source 7	**0xA8**	**0xB8**	**0xC8**	**0xD8**	**0xE8**	**0xF8**	**0x18**	**0x28**
Source 8	**0xA7**	**0xB7**	**0xC7**	**0xD7**	**0xE7**	**0xF7**	**0x17**	**0x27**

Note: Using terminal to set Custom Code

Example: Set custom code from 0x01 0xEE to 0x13 0x31

>>IR4 ---------- command (using RS-232 terminal command mode)

>>IR4 ---------- echo

Command	Custom Code
IR2	**0x00 0xFF**
IR3	**0x12 0x21**
IR4	**0x13 0x31**

For further information, please check the installation CD.